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10/626,980

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Helmut Laig-Hoerstebroek

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FOLEY & LARDNER  
777 EAST WISCONSIN AVENUE  
SUITE 3800  
MILWAUKEE, WI 53202-5308

EXAMINER

TIBBITS, PIA FLORENCE

ART UNIT

PAPER NUMBER

2838

DATE MAILED: 12/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/626,980

Applicant(s)

LAIG-HOERSTEBROCK ET AL.

Examiner

Pia F Tibbits

Art Unit

2838

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1/16, 9/17/6 pgs) and 10/5/2004
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This Office action is in answer to the preliminary amendment filed 1/16/2004.

#### ***Drawings***

1. The subject matter of this application admits of illustration by a drawing to facilitate understanding of the invention [see claims 16 and 17]. Applicant is required to furnish a drawing under 37 CFR 1.81. No new matter may be introduced in the required drawing.
2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the battery, the temperature bands, the size, the measure, the motor vehicle, the temperature measurement device, the computation device must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement-drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

#### ***Specification***

1. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant

Art Unit: 2838

may become aware in the specification. For example, "the further state variables" is idiomatic, and needs to be redefined.

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter: "applicable time", "linked wear variable". See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction is required.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. The claims are generally narrative and indefinite, failing to conform to current U.S. practice. They appear to be a literal translation into English from a foreign document and contain grammatical and idiomatic errors.

Claims 1, 16 and 17: "the wear contributions rising more than proportionally as the battery temperature rises" is not clear since "rising more than proportionally" is neither described, nor shown.

Claim 4: the "lower limit temperature" and the "upper limit temperature" need to be defined.

Claim 5: the "battery temperature below the lower limit temperature" needs to be defined.

Claim 6. "the wear contributions increasing more than proportionally with the battery temperature for battery temperatures above an upper limit temperature" is not clear since "rising more than proportionally" is neither described, nor shown.

Claim 10: "the time intervals each being of such...as a function": the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 11: "the battery has a storage capacity and the wear variable is a measure of the storage capacity of the battery, with the wear variable being related to the storage capacity of the battery at an

Art Unit: 2838

earlier time than the time which is applicable to the wear variable" is not clear since a) "the wear variable is determined as a sum of temperature-dependent wear contributions over time" [see claim 1], and therefore, if "the wear variable is a measure of the storage capacity of the battery", the storage capacity of the battery would be zero; and b) "at an earlier time than the time which is applicable" is indefinite. To continue prosecution, it was assumed that the storage capacity of the battery is a function of the wear variable.

The above are but a few specific examples of indefinite and functional or operational language used throughout the claims, and are only intended to illustrate the extensive revision required to overcome the rejections under 35 USC 112, second paragraph. The above-mentioned corrections therefore, are in no way a complete and thorough listing of every indefinite and functional or operational language used throughout the claims. Applicant is required to revise all of the claims completely, and not just correct the indefinite and functional or operational language mentioned. The following art rejections are given in view of the above rejections of claims under 35 USC 112, second paragraph. Therefore, the following art rejections are applied only as far as the claims are understood in view of rejections made under the second paragraph of 35 USC 112.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 2, 4 rejected under 35 U.S.C. 103(a) as being unpatentable over prior art disclosed by applicant, WO 89/01169 [hereinafter WO] in view prior art disclosed by applicant, DE-19540827 [hereinafter DE].

At the outset, the examiner notes that claims are to be given their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969). See also *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow.... The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed.... An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process."). In responding to this Office action, applicants are reminded of the requirements of 37 CFR 1.111 and 1.119 that applicants specifically point out the specific distinctions believed to render the claims patentable over the references in presenting responsive arguments. See MPEP 714.02. The support of any amendments made should also be specifically pointed out. See MPEP 2163.06.

WO discloses an apparatus for monitoring the state-of-charge of a battery including, *inter alia*, means for measuring the battery temperature T, and means responsive to over time/successive measured values of the temperature T [see abstract], and that a battery mathematical model could take into account changing battery characteristics due to aging/determining a wear variable [see page 3, lines 9-14; page 14, lines 26-34; page 20, lines 25-31]. WO does not disclose the wear variable is determined as a sum of temperature- dependent wear contributions over time.

DE discloses in the abstract the determined aging parts of a battery are summed up, to form a battery aging value/wear variable as a measure for the battery aging condition. The useful end of the battery life is defined as the reaching of a normal battery aging value, which is standardized as a working life duration. A specified percent amount, which is no longer available as power from the battery, is obtained empirically from a specified graph. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify WO's apparatus and include DE's

Art Unit: 2838

teachings to sum up the determined aging parts and determine a wear variable as a function of the battery temperature over time, in order to empirically determine the specified percent amount no longer available as power from the battery.

As to claim 2, WO and DE disclose using a mathematical model to empirically determine the specified percent amount no longer available as power from the battery. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine all the variables involved in determining the wear variable as a function of the battery temperature in one equation, since it is very well known in the art to do so in order to define a particular process by performing routine derivations of very well known equations.

As to claim 4, WO discloses using a Kalman filter to linearize non-linear systems and update the SOC estimate [see pages 6, 7, 12].

As to claims 7-9, see remarks for claim 2 above.

As to claim 11, WO discloses determining the instantaneous battery SOC  $I_z$  and that the battery has a storage capacity/SOC/withdrawable charge  $q_e$ , which is a function of the wear variable [see pages 1, lines 6-11; page 6, lines 15-18; page 23, lines 25-30].

As to claim 12, WO discloses the storage capacity  $q_e$  of the battery is compared to an initial capacity/rated charge  $Q_n$  of the battery in a new battery [see page 21, lines 1-8].

As to claim 13, the wear variable relating to the earlier time is zero: it is an inherent function of the apparatus discloses by WO to have a zero wear variable for a new battery [see remarks for claim 12 above], and MPEP 2100 states that the disclosure of a limitation may be expressed, implicit or **inherent**.

As to claim 14, the present storage capacity of the battery being the difference between an initial capacity of the battery in a new state and the wear variable: it is an inherent function of the apparatus discloses by WO to have a present storage capacity of the battery being the difference between an initial capacity of the battery in a new state and the wear variable[see remarks for claim 12 above; page 17, line 25], and MPEP 2100 states that the disclosure of a limitation may be expressed, implicit or **inherent**.

Art Unit: 2838

As to claim 15, "determining a linked wear variable from the wear variable and further state variables which describe a state of the battery" was interpreted to mean measuring and taking into account other variables influencing the battery state, and WO's apparatus includes a) means for periodically measuring the output voltage (u), the current (i) being withdrawn from or supplied to the battery, and the temperature (T) of the battery, b) battery current integrating means for integrating the battery current (i) with respect to time to produce an indication of the net charge (q) taken from the battery, c) means responsive to successive measured values of battery voltage (u), current (i) and temperature (T) and to the net charge (q) taken from the battery to predict the net charge ( $q_e$ ), which can still be withdrawn from the battery [see the abstract].

With respect to the method claims 1-15: the method steps will be met during the normal operation of the apparatus described above.

As to claims 16 and 17, see remarks for claim 1 above.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

#### ***Information Disclosure Statement***

9. The information disclosure statement filed 9/17/2004 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of non-patent literature documents A139 and A140 that are not in the English language. They have been placed in the application file, but the information referred to therein has not been considered.



Art Unit: 2838

10. Patent applicant has duty not just to disclose pertinent prior art references but to make the disclosure in such way as not to "bury" it within other disclosures of less relevant prior art; See *Golden Valley Microwave Foods Inc. v. Weaver Popcorn Co. Inc.*, 24 USPQ2d 1801 (N.D.I. 1992); *Molins PLC v. Textron Inc.*, 26 USPQ2d 1889, at 1899 (D.Del. 1992); *Penn Yan Boats, Inc. v. Sea Lark Boats, Inc. et al.*, 175 USPQ 260, at 272 (S.D. Fl. 1972).

11. Significantly, an applicant's duty of disclosure of material and information is not satisfied by presenting a patent examiner with "a mountain of largely irrelevant [material] from which he is presumed to have been able, with his expertise and with adequate time, to have found the critical [material]. It ignores the real world conditions under which examiners work." *Rohm & Haas Co. v. Crystal Chemical Co.*, 722 F.2d 1556, 1573 [220 USPQ 289] (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). (Emphasis in original).

12. The Information Disclosure Statement (PTO-1449) filed 9/17/2004 references DE-19540827. Since this reference seems to read on applicant's claims for the instant application, a full translation should be provided.

### ***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Prior art disclosed by applicant: "**Bosch and the new E-class**" discloses the E-class Electronic Battery Management measures temperature, voltage, as well as energy flow to determine battery state-of-health and state-of-charge, and predicts the expected state-of-charge based on a charge profile continuously adapted to the changing conditions of the on-board network; **WO 01/15023** discloses a modularized battery model using software code which simulates the performance of real battery, i.e., physical properties, chemical properties, charge and discharge rates, temperature, and history of usage of the rechargeable cells; **DE-3334128** discloses a method and circuit arrangement for determining the state of a vehicle battery by using influencing variables of the battery which are important during travel mode, namely the temperature, age and self-discharging of the battery, are taken into account **additively**

Art Unit: 2838

during the determination of the remaining discharge time; **DE-19952693** discloses a procedure for determining a battery condition in which the battery charge, temperature, charging current, discharging current and charging current are measured, and are then used to determine battery state or condition. The device for determining the battery condition includes several sensors used to measure charge, temperature, charging current, discharging current in conjunction with an analysis circuit that processes the measurement values from the sensors.

The prior art cited in PTO-892 and not mentioned above disclose related apparatus: **Morimoto** [6828798] discloses a vehicle battery ECU monitors the operating conditions of the battery pack modules based on the charge/discharge current and voltage of the battery pack modules, the voltage and temperature of each battery module, and the temperature of the battery pack modules, all of which are detected by the current, the voltage and the temperature sensors, in order to compute the **SOC (State of Charge)**, that is the amount of charge accumulated relative to the **battery capacity**, based on the voltages, currents, and temperatures detected, requiring a vehicle ECU serving as a vehicle controller to provide such a charge and discharge state so as to maintain the SOC at an appropriate state. The data on the voltage, current, and temperature as well as the computed SOC are delivered to the vehicle ECU as information on the operating condition. **Tate et al.** [6441586] discloses a method of optimizing a SOC estimation by using a Kalman Filter to linearize non-linear systems and update the SOC estimate [see also column 3, lines 18-30; column 11, lines 63-65; column 12, lines 16-21; column 14, lines 33-51].

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Pia Tibbits whose telephone number is (571) 272-2086. If unavailable, contact the Supervisory Patent Examiner Mike Sherry whose telephone number is (571) 272-2084. The Technology Center Fax number is (703) 872-9306.

15. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

Art Unit: 2838

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PFT

February 3, 2004

Pia Tibbits

Primary Patent Examiner

A handwritten signature in black ink, appearing to be 'Pia Tibbits', written over the printed name and title.